Keystone Compliance, LLC
131 Columbus Inner Belt
New Castle, PA 16101

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Lifesaving Systems

1703-001NB



ENVIRONMENTAL TEST REPORT 1703-001NB REV. A

TEST STANDARDS: MIL-STD-810G

For

LIFESAVING SYSTEMS
220 ELSBERRY ROAD
APOLLO BEACH, FL 33572

On

D-LOK RESCUE HOIST HOOKS & MIL-LOK RESCUE HOIST HOOKS
MODEL NUMBER: REV D & REV G; PART NUMBER: 410 & 412 ; SERIAL NUMBER: 0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203

PERFORMED BY: **KEYSTONE COMPLIANCE, LLC.**
131 COLUMBUS INNER BELT
NEW CASTLE, PA 16101

Keystone Compliance, LLC. does hereby certify that all inspections and tests have been performed in accordance with the documents referenced herein with exceptions as noted in this report. The results in this report pertain to the specified equipment tested. This report shall not be reproduced, except in full, without the written authorization of Keystone Compliance, LLC.

Prepared By: _____ **Date:** 7/12/2017
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DOCUMENT HISTORY

Revision	Issue Date	Description Of Modifications	Revised By	Approved By
N/C	5/26/2017	Initial release	N/A	R.T.
A	7/12/2017	Added note under Salt Fog data sheet, updated Cal expiration date for Force Sensor, added force sensor picture, added Micometer to the equipment list and added additional comments to the Icing Test	AH	RT

CLIENT INFORMATION

Purchase Order	1369
Quote Number	1703-001NB
EUT Arrival Date	5/10/2017 -- Received in good condition
Company Name	Lifesaving Systems
Address	220 Elsberry Road
City, State Zip	Apollo Beach, FL 33572
Contact Name	Thomas Beach
Phone	813-645-2748
Email	T.Beach@lifesavingsystems.com

TEST FACILITY INFORMATION

Test Laboratory	Keystone Compliance, LLC.
Address	131 Columbus Inner Belt
City, State, Zip Code	New Castle, PA 16101
Phone	(724) 657-9940
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Web Site	www.keystonecompliance.com
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TEST PROGRAM INFORMATION

Test Personnel	Tyler Masone – Environmental Test Technician
Test Title & Test Dates	Salt Fog -- May 1, 2017 to May 5, 2017 Icing -- May 9, 2017 Transit Drop Shock -- May 18, 2017
Test Personnel	Darren Pierce – Environmental Test Technician
Test Title & Test Dates	Gate Resistance -- May 24, 2017

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INTRODUCTION

This report documents the results of a series of Environmental tests performed on the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, Model Number: Rev D & Rev G; Part Number: 410 & 412 ; Serial Number: 0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203, submitted by Lifesaving Systems.

The Environmental test program described herein were performed in accordance with the applicable requirements of MIL-STD-810G .

All test data is included in Section 3 of this document.

All tests were performed at the Keystone Compliance New Castle, PA Environmental test facility. All testing was performed using the test set-ups of the relevant standard for tests performed in laboratory conditions.

ACRONYMS AND ABBREVIATIONS

°C – Degrees Celsius

cm – Centimeter

m – Meters

N/A – Not Applicable

M/N – Model Number

P/N – Part Number

S/N – Serial Number

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EQUIPMENT UNDER TEST(S)

EUT		
Description		Manufacturer
D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks		**Lifesaving Systems**
Model Number	Part Number	Serial Number
Rev D & Rev G	**410 & 412**	**0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203**



SUMMARY OF TESTS PERFORMED & RESULTS

TABLE 1 TESTS PERFORMED & RESULTS

Report Paragraph	Test Description	Results
3.3	Salt Fog	Minor evidence of localized corrosion to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Salt Fog testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.
3.4	Icing	No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Icing testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.
3.5	Transit Drop Shock	No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Transit Drop Shock testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.
3.6	Gate Resistance	No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Gate Resistance testing conditions. Load testing of Hooks met requirements. Final disposition is to be determined by customer.

SECTION 1 – TEST CONDITIONS AND EQUIPMENT

1.1 AMBIENT ENVIRONMENTAL CONDITIONS

Unless otherwise specified herein, all tests were performed at an atmospheric pressure of 28 ±2.5 inches of mercury absolute, a temperature of 75 ±15°F, and a relative humidity of 50 ±30%.

1.2 INSTRUMENTATION AND EQUIPMENT

Measuring and test equipment, utilized in the performance of these tests, was calibrated in accordance with ANSI/NCSL Z540-3-2006, by Keystone Compliance, LLC.. or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Institute of Standards & Technology (NIST). All reference standards utilized in the above calibration system are supported by certificates, reports, or data sheets attesting to the date, accuracy, and conditions under which the results furnished were obtained. All subordinate standards, measuring and test equipment are supported by like data, when such information is essential to achieve the accuracy control required by the procedure.

Keystone Compliance, LLC.. attests that the commercial sources providing calibration services on the above referenced equipment, other than the NIST Standards are in fact capable of performing the required services to the satisfaction of Keystone Compliance, LLC.. Quality Assurance. Certifications of all calibrations performed are retained on file in the Keystone Compliance, LLC.. Quality Assurance Department, and are available for inspection upon request by customer representatives.

The test equipment utilized during this test program is listed on individual Test Equipment Sheets located in Section 3 of this document.

1.3 TOLERANCES

All test conditions were maintained within all applicable specified tolerances.

SECTION 2 – REFERENCES

2.1 APPLICABLE SPECIFICATIONS

Reference Specification Title	**MIL-STD-810G** **Environmental Engineering Considerations and Laboratory Tests**
Reference Specification Title	**ANSI Z359.1** **The Fall Protection Code**
Calibration Information	**ANSI/NCSL Z540-3-2006** **Calibration Laboratories and Measuring Test Equipment - General Requirements**

SECTION 3 – TEST LOGS, TEST EQUIPMENT, TEST DATA, & TEST PHOTOGRAPHS

3.1 TEST LOG

Test Log			
EUT:	**D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks**	Job Number:	**1703-001NB**
Customer:	**Lifesaving Systems**	Model Number:	**Rev D & Rev G**
Date:	**5/1/17 - 5/24/17**	Part Number:	**410 & 412**
Test Engineer:	**T.Masone**	Serial Number:	**0204, 0202 ,3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203**
Test:	**All Tests**		
Test Specifications			
Test Spec:	**MIL-STD-810G**	Para./Sec.:	**See Data**

Date	Time	Description
Salt Fog		
Before starting test, measurement of force required to move the locking mechanism from the locked to unlock position and force required to open the latch were taken. The measurements were as follows: **SN:0203** - Pull Back Latch 3.3lbs; Open Hook 4.5lbs **SN:3573** - Push In Latch 5.3lbs; Open Hook 4.6lbs		
5/1/17	14:45	Started Salt Fog Testing.
5/5/17	14:45	Salt Fog Testing Complete.
After completion of the test, the force measurements for the locking mechanism and latch were taken. The measurements were as follows: **SN:0203** - Pull Back Latch 3.4lbs; Open Hook 4.7lbs **SN:3573** - Push In Latch 5.4lbs; Open Hook 4.7lbs The lock was verified to prevent the safety latch from opening unless the lock is disengaged. The proper engagement and disengagement of the locking mechanism was verified also. There were no issues noted. In addition, gate resistance test was performed on the hooks. Neither hook separated more than 0.125 inch and the latch and lock still functioned as intended. See data sheet for more information. There were some evidence of light corrosion on the hooks. It does not appear that the amount of corrosion would pose an immediate or long-term effect on the proper functioning and structural integrity of each hook. Final disposition to be provided by Customer.		

Test Log			
EUT:	**D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks**	Job Number:	**1703-001NB**
Customer:	**Lifesaving Systems**	Model Number:	**Rev D & Rev G**
Date:	**5/1/17 - 5/24/17**	Part Number:	**410 & 412**
Test Engineer:	**T.Masone**	Serial Number:	**0204, 0202 ,3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203**
Test:	**All Tests**		
Test Specifications			
Test Spec:	**MIL-STD-810G**	Para./Sec.:	**See Data**

Icing		
Before starting test, measurement of force required to move the locking mechanism from the locked to unlock position and force required to open the latch were taken. The measurements were as follows: **SN:0200** - Pull Back Latch 3.2lbs; Open Hook 4.5lbs **SN:3574** - Push In Latch 5.3lbs; Open Hook 4.6lbs		
5/9/17	12:00	Started Icing Test.
	17:00	Icing Testing Complete.
After completion of the test, ice was removed from the hooks. No damage to the hook was observed as a result of ice removal. The force measurements for the locking mechanism and latch were taken. The measurements were as follows: **SN:0200** - Pull Back Latch 3.2lbs; Open Hook 4.5lbs **SN:3574** - Push In Latch 5.3lbs; Open Hook 4.6lbs The lock was verified to prevent the safety latch from opening unless the lock is disengaged. The proper engagement and disengagement of the locking mechanism was verified also. There were no issues noted. Neither hook separated more than 0.125 inch and the latch and lock still functioned as intended. See data sheet for more information.		

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Test Log			
EUT:	**D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks**	Job Number:	**1703-001NB**
Customer:	**Lifesaving Systems**	Model Number:	**Rev D & Rev G**
Date:	**5/1/17 - 5/24/17**	Part Number:	**410 & 412**
Test Engineer:	**T.Masone**	Serial Number:	**0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203**
Test:	**All Tests**		
Test Specifications			
Test Spec:	**MIL-STD-810G**	Para./Sec.:	**See Data**

Sand & Dust
Before starting test, measurement of force required to move the locking mechanism from the locked to unlock position and force required to open the latch were taken. The measurements were as follows: **SN:0201** - Pull Back Latch 3.2lbs; Open Hook 4.5lbs **SN:3569** - Push In Latch 5.3lbs; Open Hook 4.6lbs
Testing Performed by E-Labs – See Appendix for Report
After completion of the test, the force measurements for the locking mechanism and latch were taken. The measurements were as follows: **SN:0201** - Pull Back Latch 3.4lbs; Open Hook 4.7lbs **SN:3569** - Push In Latch 5.6lbs; Open Hook 4.9lbs The lock was verified to prevent the safety latch from opening unless the lock is disengaged. The proper engagement and disengagement of the locking mechanism was verified also. There were no major issues noted. In initial movement of the mechanisms, slight resistance could be felt due to sand/dust penetrating. After cycling the mechanism a few times, the slight resistance went away. In addition, gate resistance test was performed on the hooks. Neither hook separated more than 0.125 inch and the latch and lock still functioned as intended. See data sheet for more information.

Test Log			
EUT:	**D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks**	Job Number:	**1703-001NB**
Customer:	**Lifesaving Systems**	Model Number:	**Rev D & Rev G**
Date:	**5/1/17 - 5/24/17**	Part Number:	**410 & 412**
Test Engineer:	**T.Masone**	Serial Number:	**0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203**
Test:	**All Tests**		
Test Specifications			
Test Spec:	**MIL-STD-810G**	Para./Sec.:	**See Data**

Transit Drop Shock

Before starting test, measurement of force required to move the locking mechanism from the locked to unlock position and force required to open the latch were taken. The measurements were as follows:
SN: 0204 - Pull Back Latch 3.3lbs; Open Hook 4.5lbs
SN: 3559 - Push In Latch 3.2lbs; Open Hook 4.5lbs
SN: 0202 - Pull Back Latch 3.4lbs; Open Hook 4.6lbs
SN: 3570 - Push In Latch 3.3lbs; Open Hook 4.5lbs

5/18/17	12:10	Started Transit Drop Shock Testing.
	13:00	Transit Drop Shock Testing Complete.

After completion of the test, the force measurements for the locking mechanism and latch were taken. The measurements were as follows:
SN: 0204 - Pull Back Latch 3.3lbs; Open Hook 4.5lbs
SN: 3559 - Push In Latch 3.2lbs; Open Hook 4.5lbs
SN: 0202 - Pull Back Latch 3.4lbs; Open Hook 4.6lbs
SN: 3570 - Push In Latch 3.3lbs; Open Hook 4.5lbs
The lock was verified to prevent the safety latch from opening unless the lock is disengaged. The proper engagement and disengagement of the locking mechanism was verified also. There were no issues noted. In addition, gate resistance test was performed on the hooks. Neither hook separated more than 0.125 inch and the latch and lock still functioned as intended. See data sheet for more information.

3.2 TEST EQUIPMENT

Equipment Log			
EUT:	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks	Job Number:	1703-001NB
Customer:	Lifesaving Systems	Model Number:	Rev D & Rev G
Date:	5/1/17 - 5/24/17	Part Number:	410 & 412
Test Engineer:	T.Masone	Serial Number:	0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203
Test:	All Tests		
Test Specifications			
Test Spec:	MIL-STD-810G	Para./Sec.:	See Data

Test Equipment

Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
NG029	Force Measurement Gauge	Chatillon	DFE2-500	T18499	10/19/17
NG017	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG018	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG019	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG020	Graduated Cylinders	Thermo Scientific Nalgene	3662	None	IPU
NG069	Tape Measure	Stanley	Fatmax	None	REF
NZ000	Salt	Morton	Batch# SS15286023	None	UWCE
NC003	Chamber, Salt Fog	Singleton Corp.	24	24362	UWCE
ND029	Drop Tester	LAB	AD125	G23545/5	IPU
OA011	Desktop Computer (ENV)	Keystone	None	None	UWCE
NA002	Hydra Series 2	Fluke	2620A	6234500	6/18/17
NC004	Chamber	Espec	EWPT287-5JW	302510	2/16/18
NG072	Stop Watch	Control Company	1051	160257399	3/8/18
NG030	Dual Output Power Supply	PDI	TW347	None	N/A
ND067	Force Sensor	PCB	1203-14A	1461	5/22/18
NA006	Hydra Series III	Fluke	2638A	34400009	3/24/18
NG027	Digital Caliper	Starrett	799A-8/200	13/320231	11/17/17

UWCE: Used With Calibrated Equipment
REF: Reference Only
IPU: Inspect Prior to Use

PAGE:	1	ENGINEER/TECHNICIAN(S):	T.Masone
OF:	1	QUALITY MANAGER:	J.Sullivan

3.3 SALT FOG TEST

a) The Salt Fog test requirements for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are specified in MIL-STD-810G.

b) The Salt Fog test log for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.1 of this document.

c) The Salt Fog test equipment used to test the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.2 of this document.

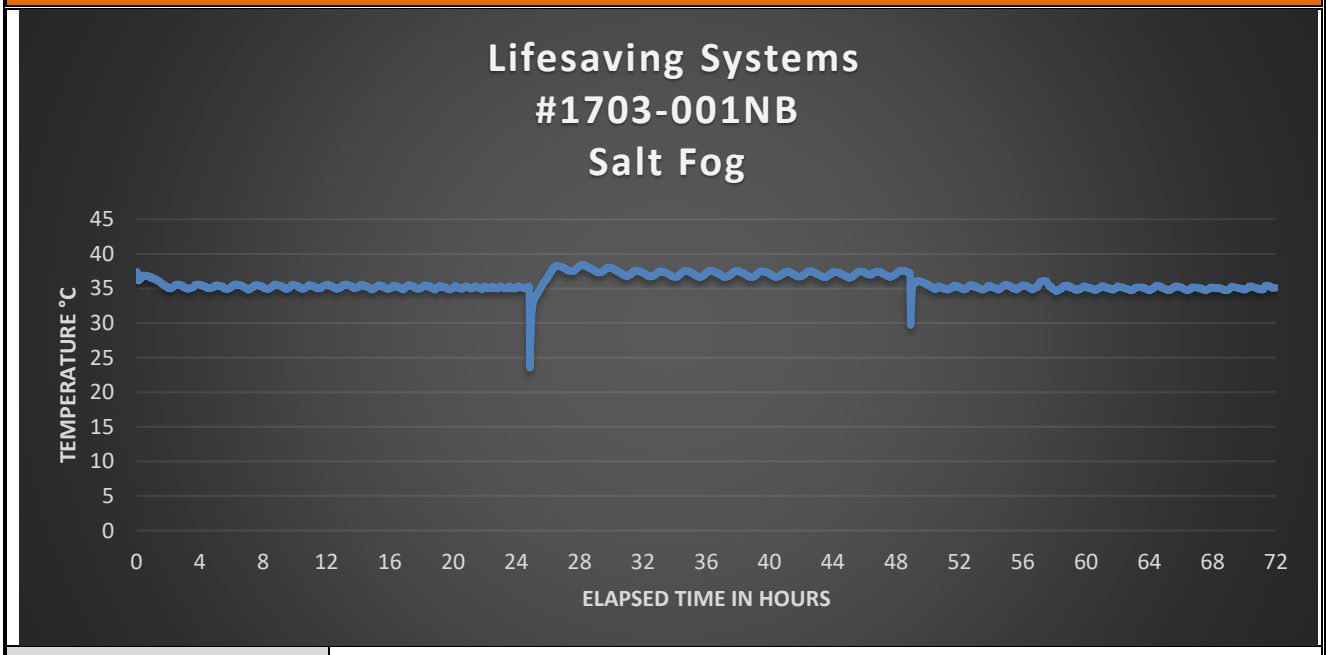
d) All recorded test data for the Salt Fog test on the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.3.1 of this document.

e) The Salt Fog test photographs for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are located in Paragraph 3.3.2 of this document.

3.3.1 SALT FOG TEST DATA

Salt Fog Data Sheet					
EUT:	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev D & Rev G	P/N:	410 & 412	S/N:	0203 & 3573
Customer:	Lifesaving Systems				
Date:	5/1/17 - 5/5/17			Test Engineer:	T.Masone
Test Specifications					
Test Spec.:	MIL-STD-810G			Para./Sec.:	509.5

Environmental Profile Information



Salt Solution:	5%
Duration (Mins/Hrs/Days):	48 Hours On 48 Hours Off
Test Cycle Begins At:	5/1/17
Test Cycle Ends At:	5/5/17
Temperature:	35°C
Fallout Rate (Per Hour):	1.4 mL/hr

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		X		Operating Mode:					
Powered During Test:		X		V		A		AC/DC	

*The test was performed as alternating 24-hour wetting and drying periods. The chamber was kept on during the drying period. EUT was removed from salt fog chamber during drying periods and put back in for the next exposure period. After the second exposure period, the chamber was turned off.

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OF: 1	TECHNICAL REVIEWER: R. Turner

3.3.2 SALT FOG TEST PHOTOGRAPHS



Salt Fog	
MIL-STD-810G	
Pre-Test Setup	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0203 & 3573
Lifesaving Systems	
Date:	5/1/17 - 5/5/17
Job #:	1703-001NB



Salt Fog	
MIL-STD-810G	
Post Test	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0203 & 3573
Lifesaving Systems	
Date:	5/1/17 - 5/5/17
Job #:	1703-001NB

3.4 ICING TEST

a) The Icing requirement for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is specified in MIL-STD-810G.

b) The Icing test log for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.1 of this document.

c) The Icing test equipment used to test the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.2 of this document.

d) All recorded test data for the Icing test on the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.4.1 of this document.

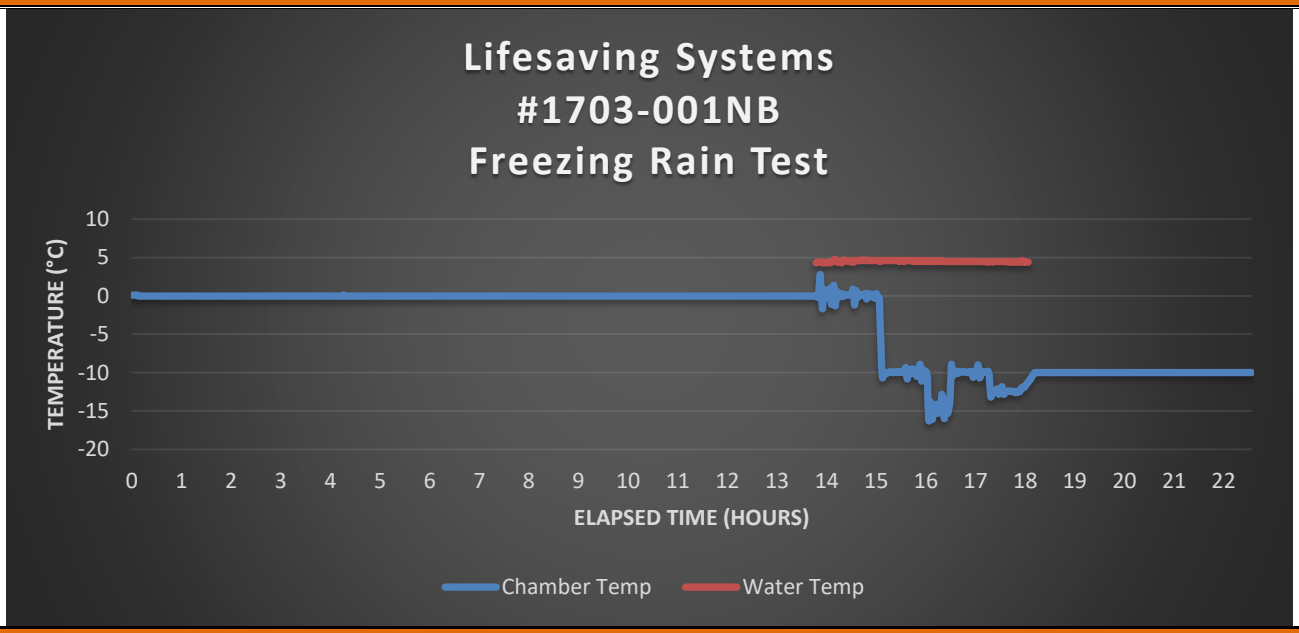
e) The Icing test photographs for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are located in Paragraph 3.4.2 of this document.

3.4.1 ICING TEST DATA

Icing Data Sheet					
EUT:	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks			Job Number:	1703-001NB
S/N:	0200 & 3574	P/N:	410 & 412	M/N:	Rev D & Rev G
Customer:	Lifesaving Systems				
Date:	5/9/17			Test Engineer:	T.Masone
Test Specifications					
Test Spec:	MIL-STD-810G			Para./Sec.:	Method 521.3

Test Data

Test Profile

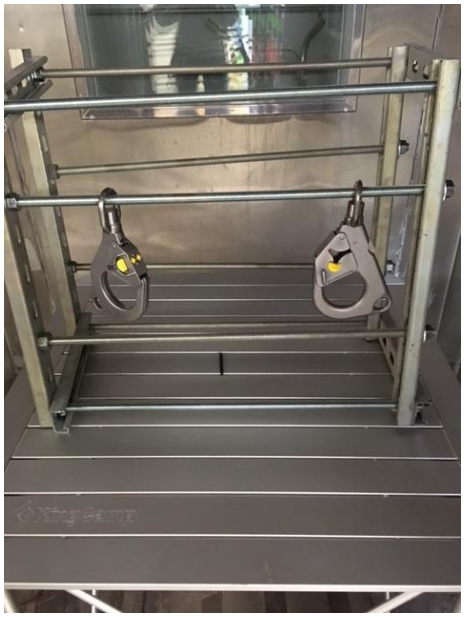


Environmental Profile Information	
Test Cycle Begins At:	5/9/17 12:00
Test Cycle Ends At:	5/9/17 17:00
Total Number of Cycles:	1
Minimum Ice Thickness:	6 mm
Ice Measurement:	Used calipers to measure ice thickness of rod near EUT. 6.1mm was measured.
Ice Type:	Glaze

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		X		Operating Mode:	N/A				
Powered During Test:		X		V	N/A	A	N/A	AC/DC	N/A
Physical Damage Noted:		X							

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OF: 1	TECHNICAL REVIEWER: R. Turner

3.4.2 ICING TEST PHOTOGRAPHS



Icing	
MIL-STD-810G	
Pre-Test Setup 1	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0200 & 3574
Lifesaving Systems	
Date:	5/9/17
Job #:	1703-001NB



Icing	
MIL-STD-810G	
Pre-Test Setup 2	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0200 & 3574
Lifesaving Systems	
Date:	5/9/17
Job #:	1703-001NB



Icing	
MIL-STD-810G	
Post Test 1	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0200 & 3574
Lifesaving Systems	
Date:	5/9/17
Job #:	1703-001NB



Icing	
MIL-STD-810G	
Post Test 2	
Unit Tested	D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0200 & 3574
Lifesaving Systems	
Date:	5/9/17
Job #:	1703-001NB

3.5 TRANSIT DROP SHOCK TEST

a) The Transit Drop Shock requirements for the D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty) are specified in MIL-STD-810G.

b) The Transit Drop Shock test log for the D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2) is located in Paragraph 3.1 of this document.

c) The Transit Drop Shock test equipment used to test the D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2) is located in Paragraph 3.2 of this document.

d) All recorded test data for the Transit Drop Shock test on the D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2) is located in Paragraph 3.5.1 of this document.

e) The Transit Drop Shock test photographs for the D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2) are located in Paragraph 3.5.2 of this document.

3.5.1 TRANSIT DROP SHOCK TEST DATA

Transit Drop Shock Data Sheet					
EUT:	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)			Job Number:	1703-001NB
M/N:	Rev D & Rev G	P/N:	410 & 412	S/N:	0204, 3570, 0202, 3559
Customer:	Lifesaving Systems				
Date:	5/18/17			Test Engineer:	T.Masone
Test Specifications					
Test Spec:	MIL-STD-810G			Para./Sec.:	Method 516.6 Procedure IV

Test Data

Test Profile	
Brief description	Definition
Transit Drop/ Shock	Drop test is performed in all required orientations where dropping the product either outside or in its transit case is practical. Total drops for each model of hook split between two S/N.

Test Profile	
Packaged-Product Weight	Drop Height
3 lbs	48”

Test Sequence			
Number	Orientation	Specific Face, Edge or Corner	Completed
1	Face	Front Face	☒
2	Face	Back Face	☒
3	Edge	Left Side Edge	☒
4	Edge	Right Side Edge	☒
5	Edge	Top Side Edge	☒
6	Edge	Bottom Side Edge	☒
7	Corner	TL Corner	☒
8	Corner	TR Corner	☒
9	Corner	BL Corner	☒
10	Corner	BR Corner	☒

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Transit Drop Shock Data Sheet					
EUT:	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)			Job Number:	1703-001NB
M/N:	Rev D & Rev G	P/N:	410 & 412	S/N:	0204, 3570, 0202, 3570
Customer:	Lifesaving Systems				
Date:	5/18/17			Test Engineer:	T.Masone
Test Specifications					
Test Spec:	MIL-STD-810G			Para./Sec.:	Method 516.6 Procedure IV

Test Data

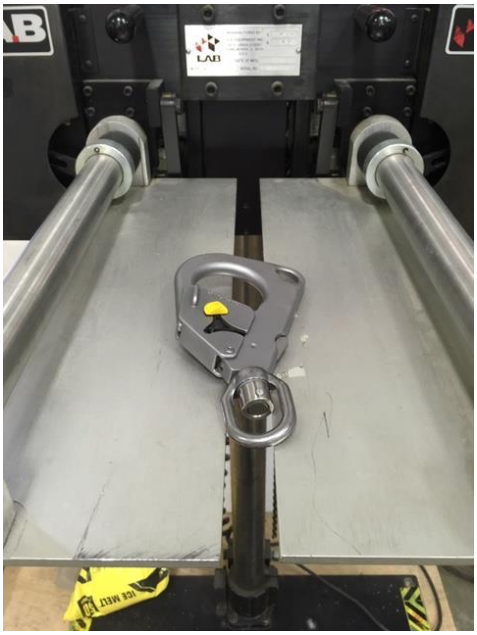
Test Sequence			
Number	Orientation	Specific Face, Edge or Corner	Completed
11	Face	Front Face	☒
12	Face	Back Face	☒
13	Edge	Left Side Edge	☒
14	Edge	Right Side Edge	☒
15	Edge	Top Side Edge	☒
16	Edge	Bottom Side Edge	☒
17	Corner	TL Corner	☒
18	Corner	TR Corner	☒
19	Corner	BL Corner	☒
20	Corner	BR Corner	☒
21	Face	Front Face	☒
22	Face	Back Face	☒
23	Edge	Left Side Edge	☒
24	Edge	Right Side Edge	☒
25	Edge	Top Side Edge	☒
26	Edge	Bottom Side Edge	☒

PAGE: 2	ENGINEER/TECHNICIAN(S): T.Masone
OF: 2	TECHNICAL REVIEWER: R. Turner

3.5.2 TRANSIT DROP SHOCK TEST PHOTOGRAPHS



Transit Drop Shock	
MIL-STD-810G	
Pre-Test	
Unit Tested	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0204, 3570, 0202, 3570
Lifesaving Systems	
Date:	5/18/17
Job #:	1703-001NB



Transit Drop Shock	
MIL-STD-810G	
Typical Test Setup 1	
Unit Tested	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0204, 3570, 0202, 3570
Lifesaving Systems	
Date:	5/18/17
Job #:	1703-001NB



Transit Drop Shock	
MIL-STD-810G	
Typical Test Setup 2	
Unit Tested	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0204, 3570, 0202, 3570
Lifesaving Systems	
Date:	5/18/17
Job #:	1703-001NB



Transit Drop Shock	
MIL-STD-810G	
Typical Post Drop	
Unit Tested	D-LOK Rescue Hoist Hooks (Qty 2) & Mil-LOK Rescue Hoist Hooks (Qty 2)
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	0204, 3570, 0202, 3570
Lifesaving Systems	
Date:	5/18/17
Job #:	1703-001NB

3.6 GATE RESISTANCE TEST

a) The Gate Resistance requirements for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are specified in ANSI Z359.1.

b) The Gate Resistance test log for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.1 of this document.

c) The Gate Resistance test equipment used to test the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.2 of this document.

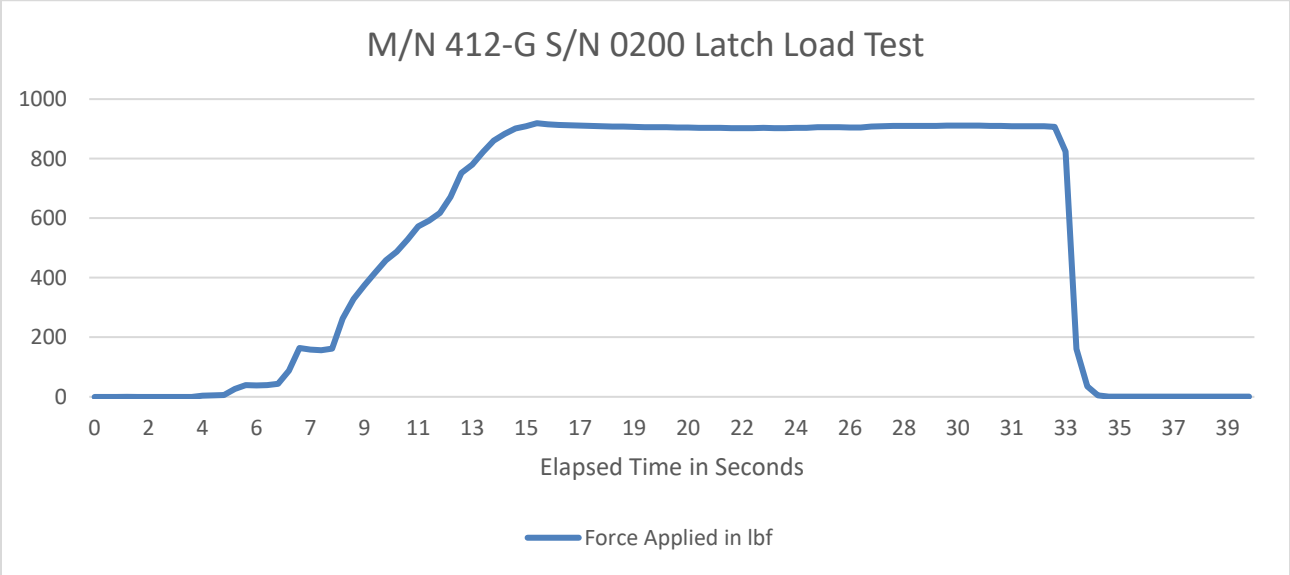
d) All recorded test data for the Gate Resistance test on the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks is located in Paragraph 3.6.1 of this document.

e) The Gate Resistance test photographs for the D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are located in Paragraph 3.6.2 of this document.

3.6.1 GATE RESISTANCE TEST DATA

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0200**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:15**
Test Cycle Ends At:	**05/24/2017 14:15**
Total Number of Cycles:	**1**

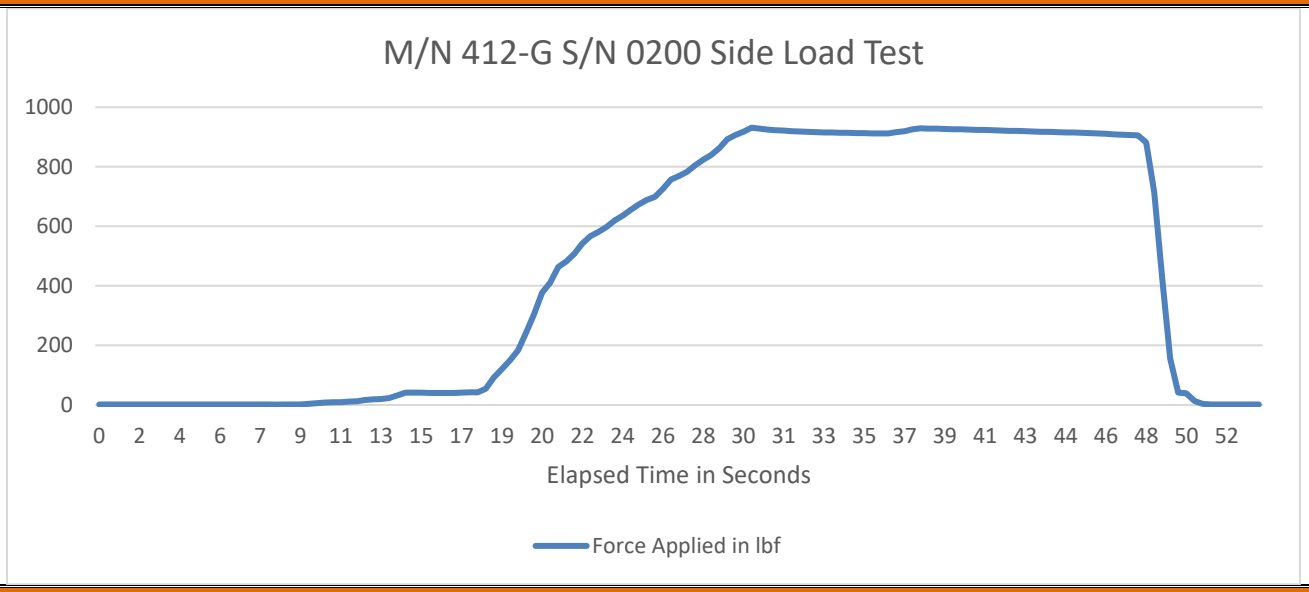
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0200**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:59**
Test Cycle Ends At:	**05/24/2017 15:00**
Total Number of Cycles:	**1**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

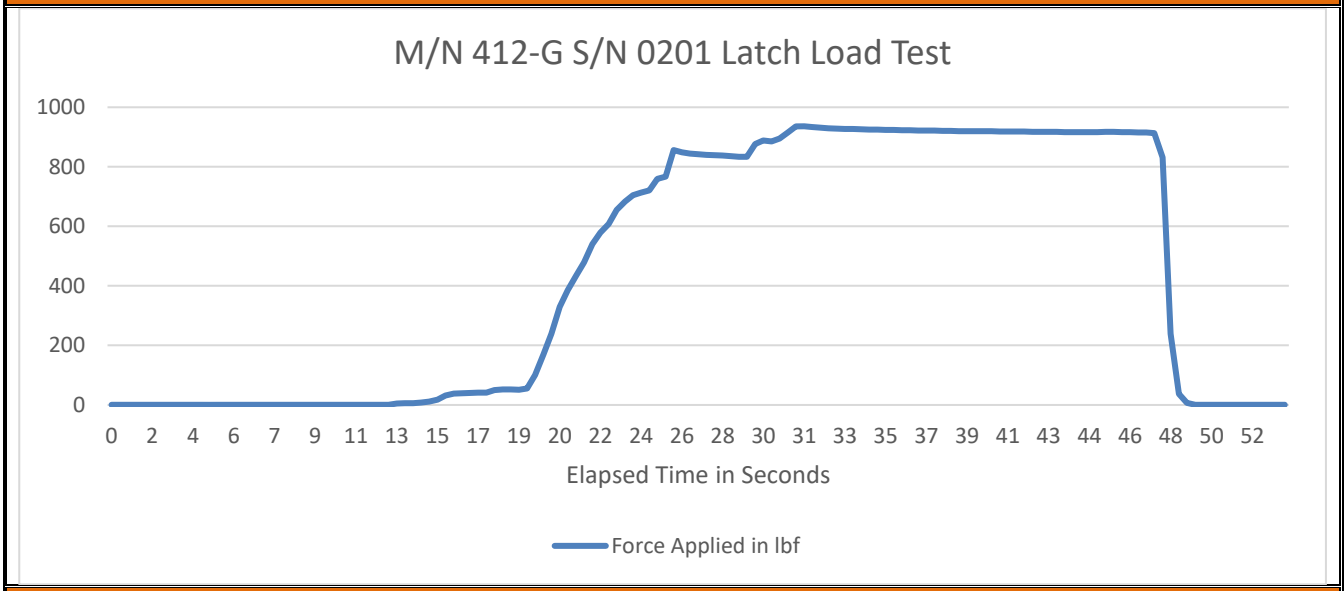
PAGE: **2** OF: **20**	ENGINEER/TECHNICIAN(S): **D. Pierce** TECHNICAL REVIEWER: **R. Turner**

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev D	P/N:	412	S/N:	0201
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



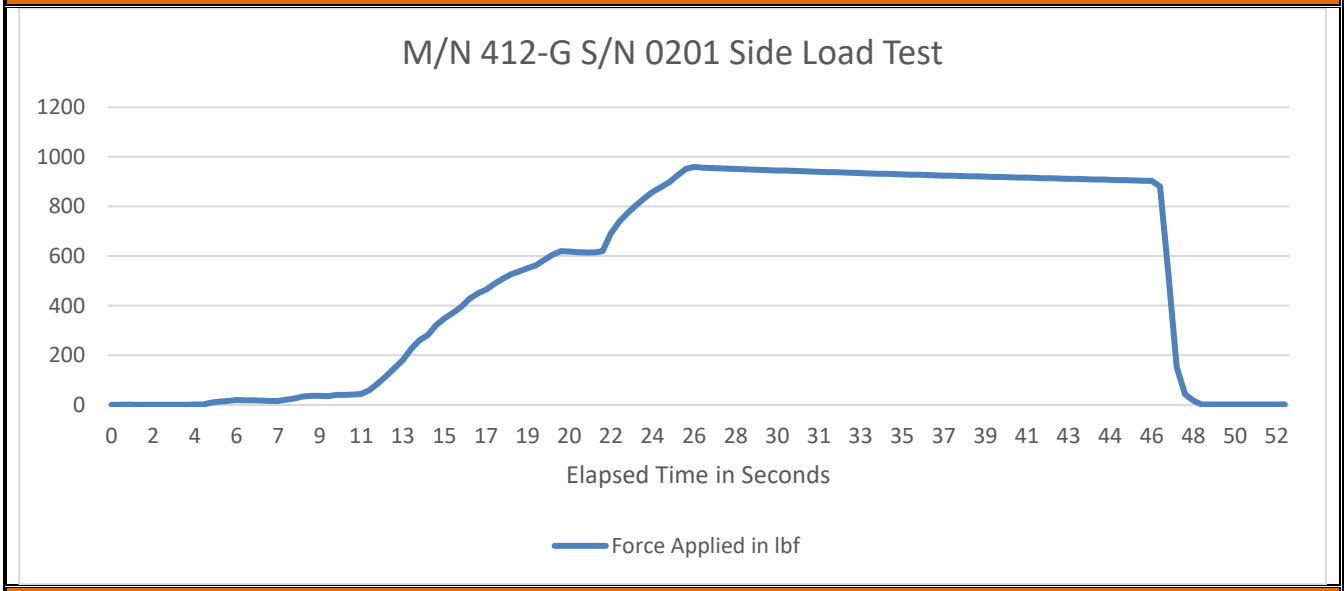
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Test Cycle Begins At:	05/24/2017 14:22
Test Cycle Ends At:	05/24/2017 14:23
Total Number of Cycles:	1

EUT Test Information	Y	N	N/A	Comments
Operating During Test:		X		Operating Mode:
Powered During Test:			X	V | A | AC/DC
Physical Damage Noted:		X		< 0.125" deflection

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0201**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 15:15**
Test Cycle Ends At:	**05/24/2017 15:16**
Total Number of Cycles:	**1**

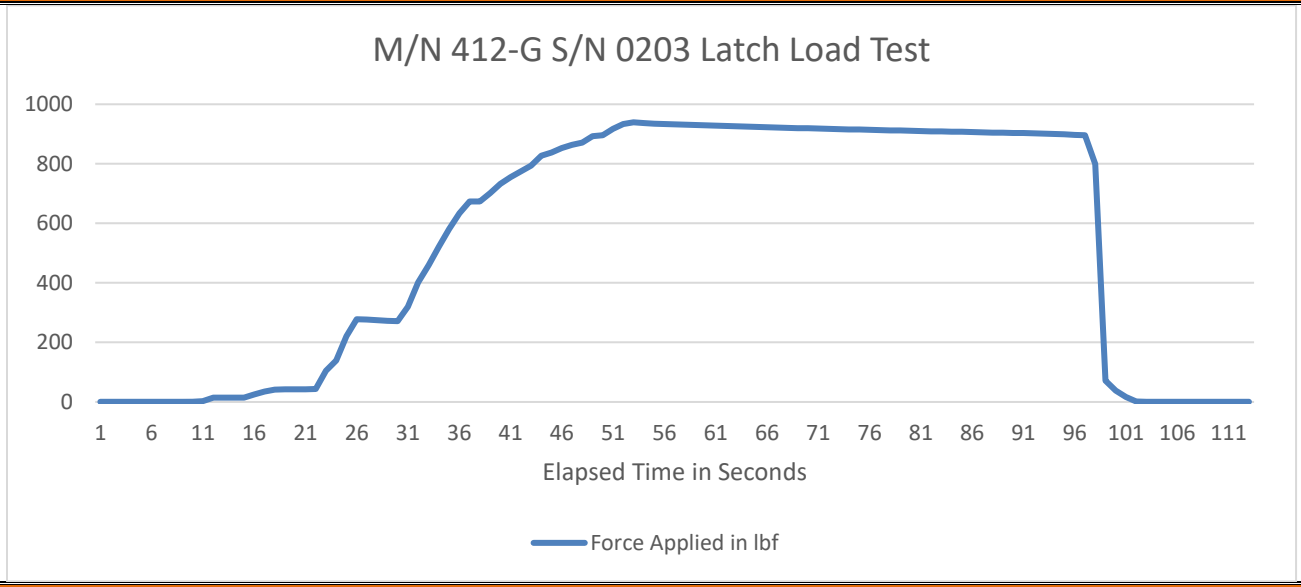
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

PAGE: **4** OF: **20**	ENGINEER/TECHNICIAN(S): **D. Pierce** TECHNICAL REVIEWER: **R. Turner**

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0203**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



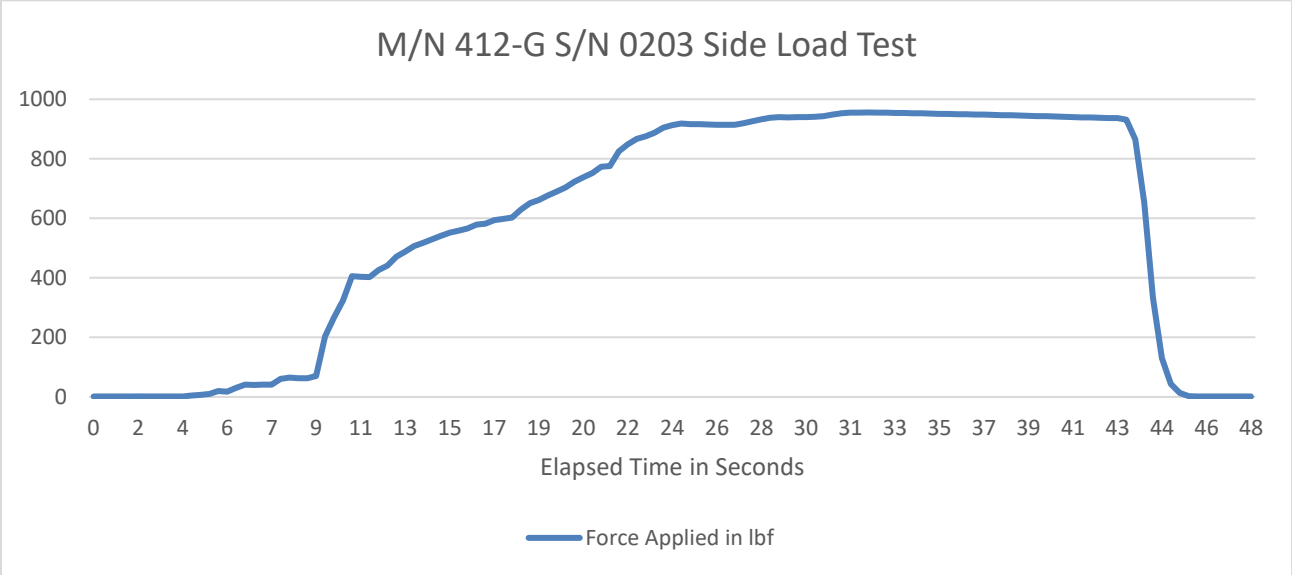
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Test Cycle Begins At:	**05/24/2017 14:26**
Test Cycle Ends At:	**05/24/2017 14:27**
Total Number of Cycles:	**1**

EUT Test Information	Y	N	N/A	Comments
Operating During Test:		**X**		Operating Mode:
Powered During Test:			**X**	V | A | AC/DC
Physical Damage Noted:		**X**		**< 0.125" deflection**

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0203**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



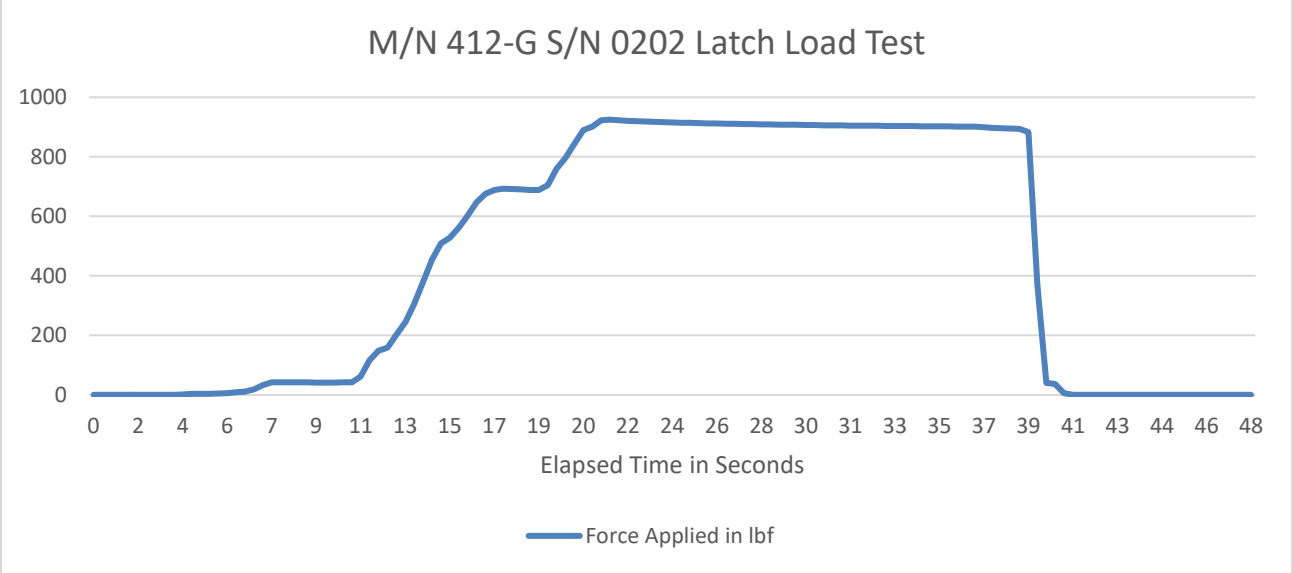
Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 15:22**
Test Cycle Ends At:	**05/24/2017 15:23**
Total Number of Cycles:	**1**

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0202**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:37**
Test Cycle Ends At:	**05/24/2017 14:38**
Total Number of Cycles:	**1**

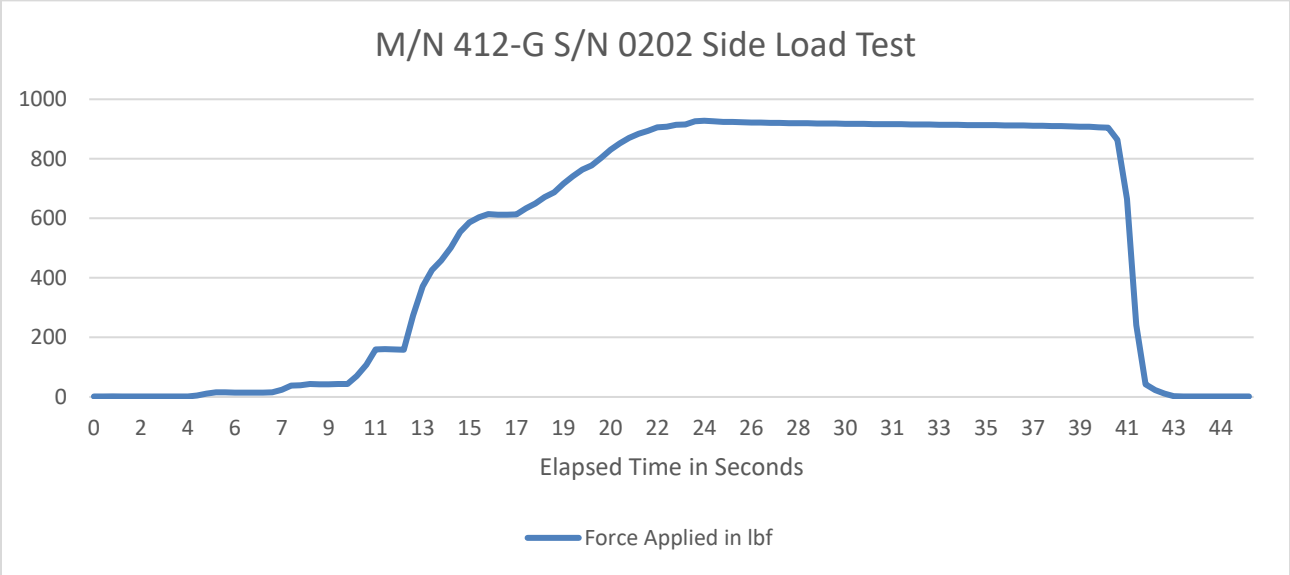
EUT Test Information	Y	N	N/A	Comments
Operating During Test:		**X**		Operating Mode:
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev D	P/N:	412	S/N:	0202
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 15:25
Test Cycle Ends At:	05/24/2017 15:25
Total Number of Cycles:	1

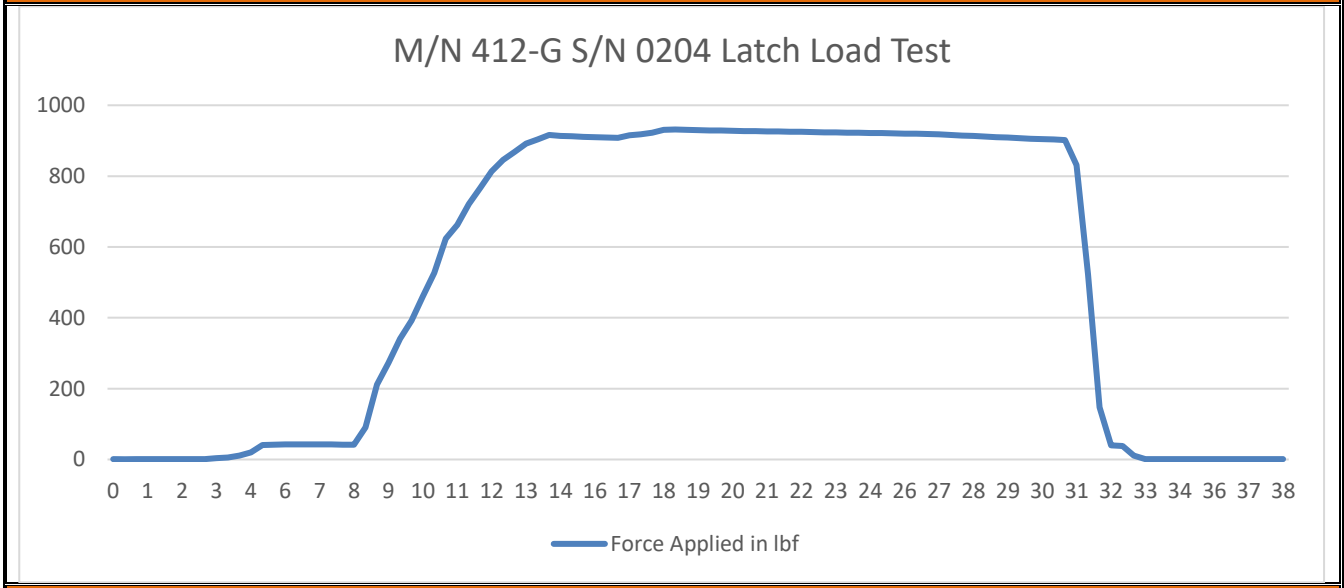
EUT Test Information	Y	N	N/A	Comments
Operating During Test:		X		Operating Mode:
Powered During Test:			X	V | A | AC/DC
Physical Damage Noted:		X		< 0.125" deflection

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev D	P/N:	412	S/N:	0204
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



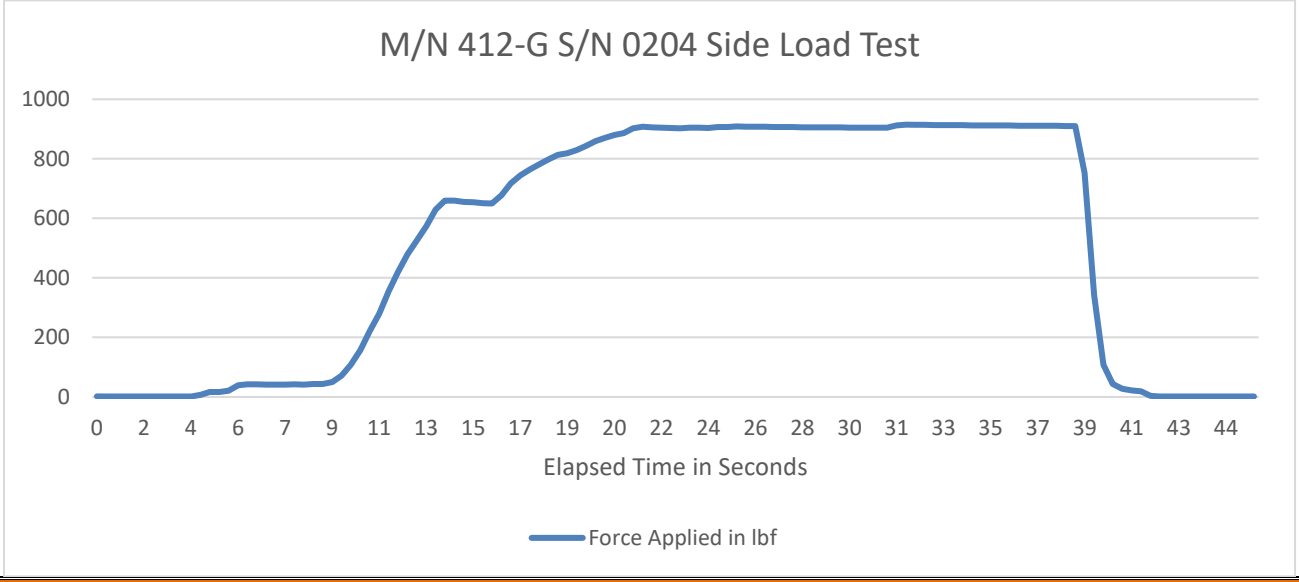
Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 14:40
Test Cycle Ends At:	05/24/2017 14:41
Total Number of Cycles:	1

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		X		Operating Mode:					
Powered During Test:			X	V		A		AC/DC	
Physical Damage Noted:		X		< 0.125” deflection					

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev D**	P/N:	**412**	S/N:	**0204**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



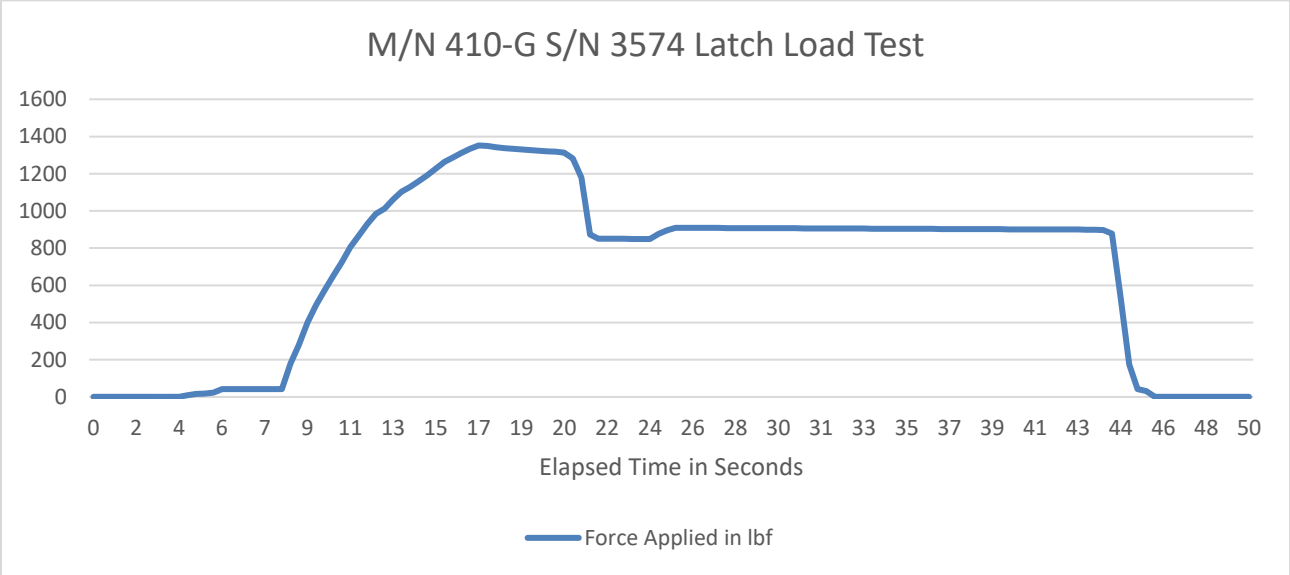
Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 15:27**
Test Cycle Ends At:	**05/24/2017 15:28**
Total Number of Cycles:	**1**

EUT Test Information	Y	N	N/A	Comments
Operating During Test:		**X**		Operating Mode:
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev G**	P/N:	**410**	S/N:	**3574**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:46**
Test Cycle Ends At:	**05/24/2017 14:46**
Total Number of Cycles:	**1**

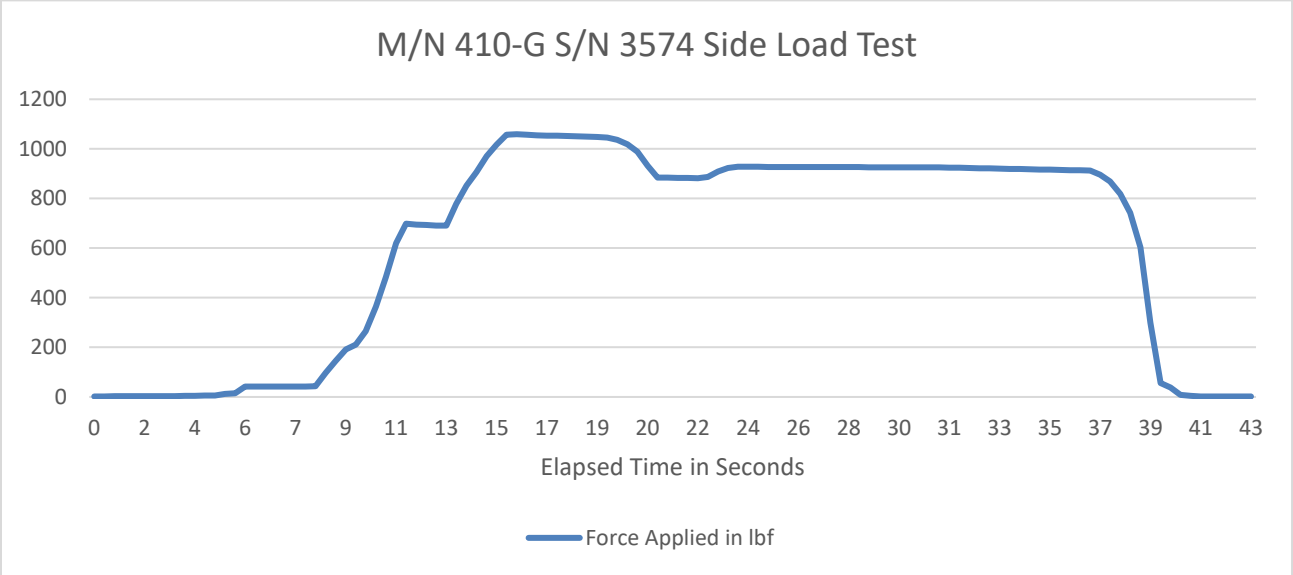
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev G**	P/N:	**410**	S/N:	**3574**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 15:43**
Test Cycle Ends At:	**05/24/2017 15:43**
Total Number of Cycles:	**1**

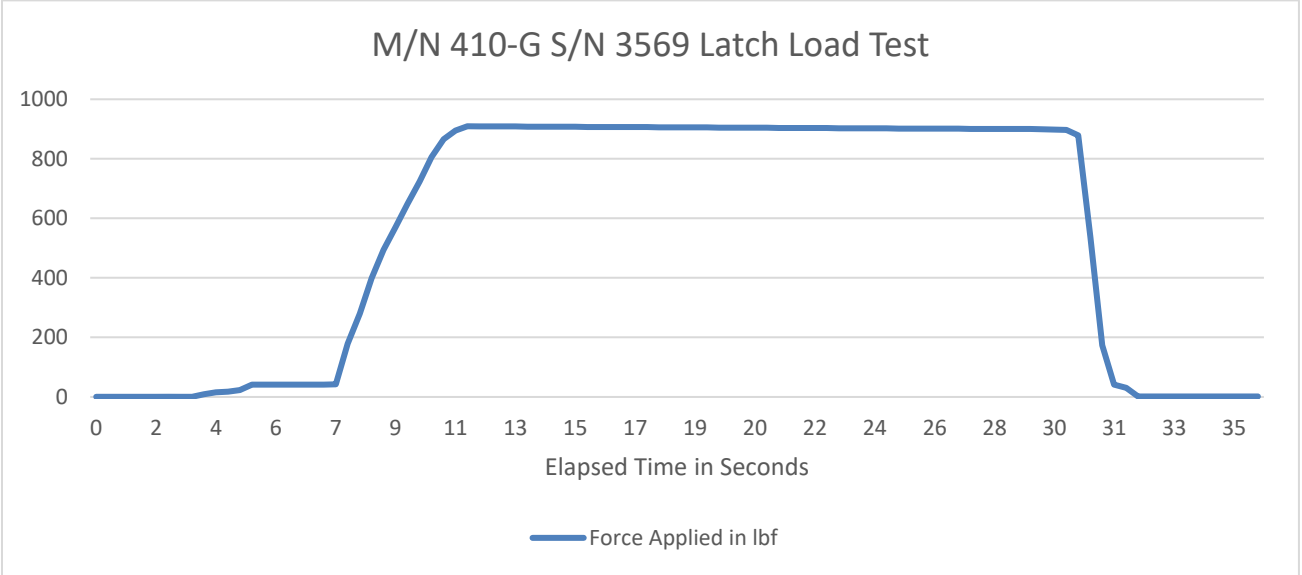
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev G	P/N:	410	S/N:	3569
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile

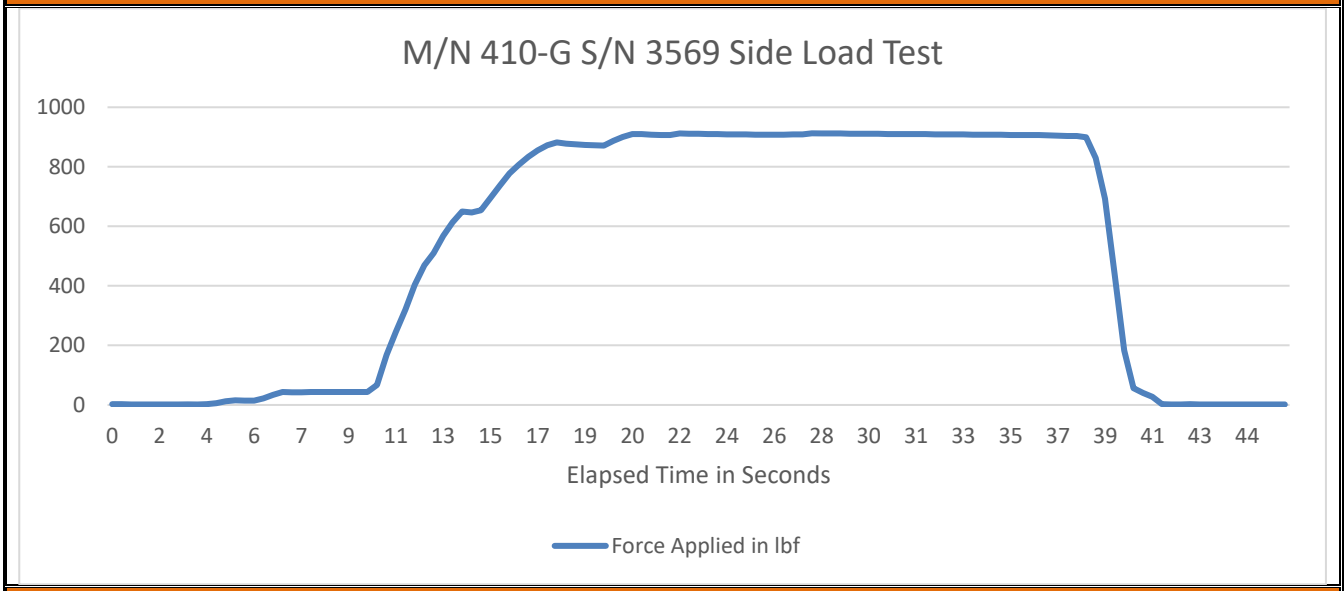


Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 14:46
Test Cycle Ends At:	05/24/2017 14:46
Total Number of Cycles:	1

EUT Test Information	Y	N	N/A	Comments
Operating During Test:		X		Operating Mode:
Powered During Test:			X	V | A | AC/DC
Physical Damage Noted:		X		< 0.125" deflection

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev G	P/N:	410	S/N:	3569
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 15:32
Test Cycle Ends At:	05/24/2017 15:32
Total Number of Cycles:	1

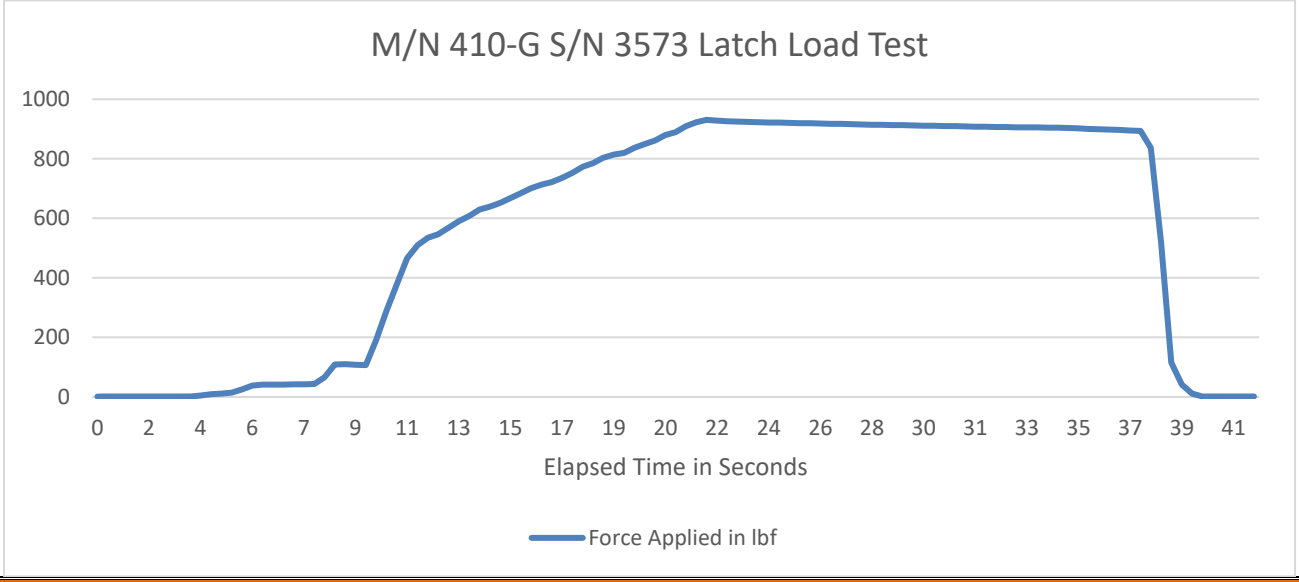
EUT Test Information	Y	N	N/A	Comments
Operating During Test:		X		Operating Mode:
Powered During Test:			X	V | A | AC/DC
Physical Damage Noted:		X		< 0.125" deflection

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev G**	P/N:	**410**	S/N:	**3573**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:48**
Test Cycle Ends At:	**05/24/2017 14:49**
Total Number of Cycles:	**1**

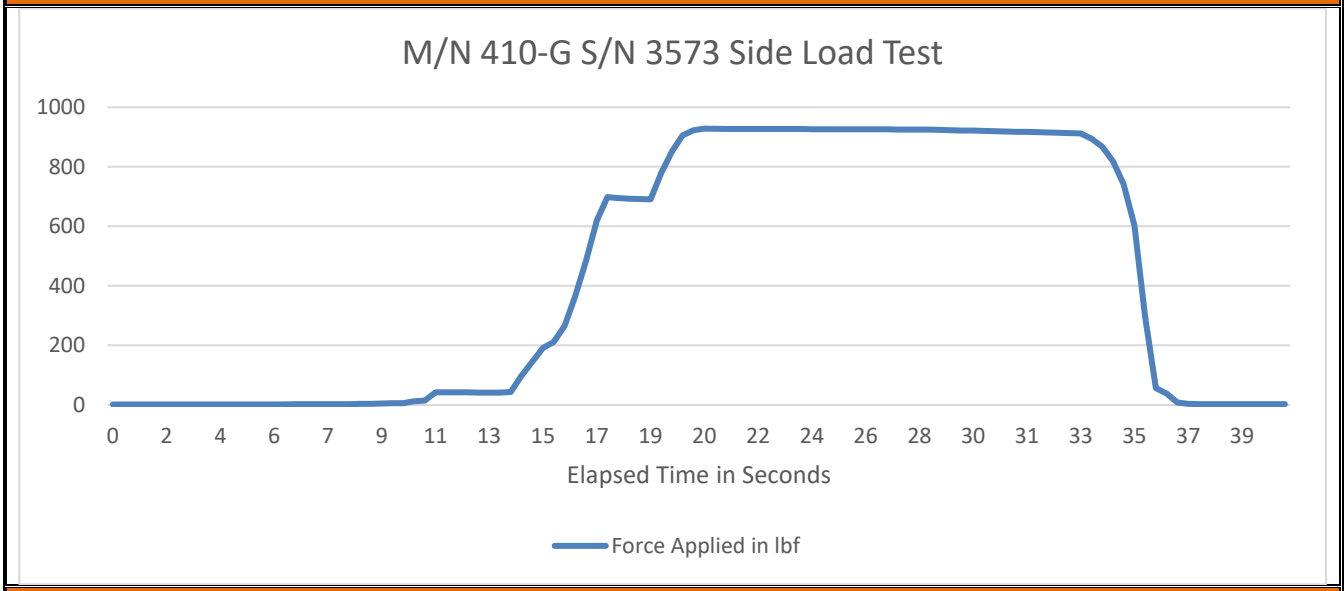
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev G**	P/N:	**410**	S/N:	**3573**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



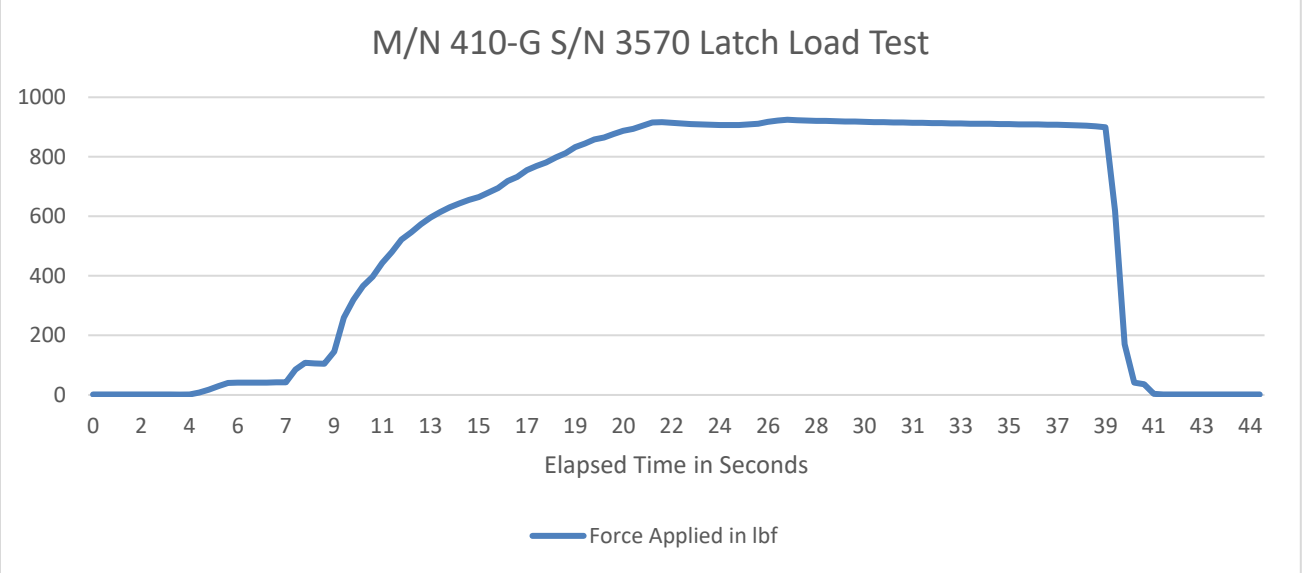
Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 15:42**
Test Cycle Ends At:	**05/24/2017 15:43**
Total Number of Cycles:	**1**

EUT Test Information	Y	N	N/A	Comments
Operating During Test:		**X**		Operating Mode:
Powered During Test:			**X**	V / A / AC/DC
Physical Damage Noted:		**X**		**< 0.125" deflection**

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	**Rescue Hoist Hooks**			Job Number:	**1703-001NB**
M/N:	**Rev G**	P/N:	**410**	S/N:	**3570**
Customer:	**Lifesaving Systems**				
Date:	**5/24/17**			Test Engineer:	**D. Pierce**
Test Specifications					
Test Spec:	**ANSI Z359.1**			Para./Sec.:	**4.3.1.1.2**

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	**05/24/2017 14:53**
Test Cycle Ends At:	**05/24/2017 14:53**
Total Number of Cycles:	**1**

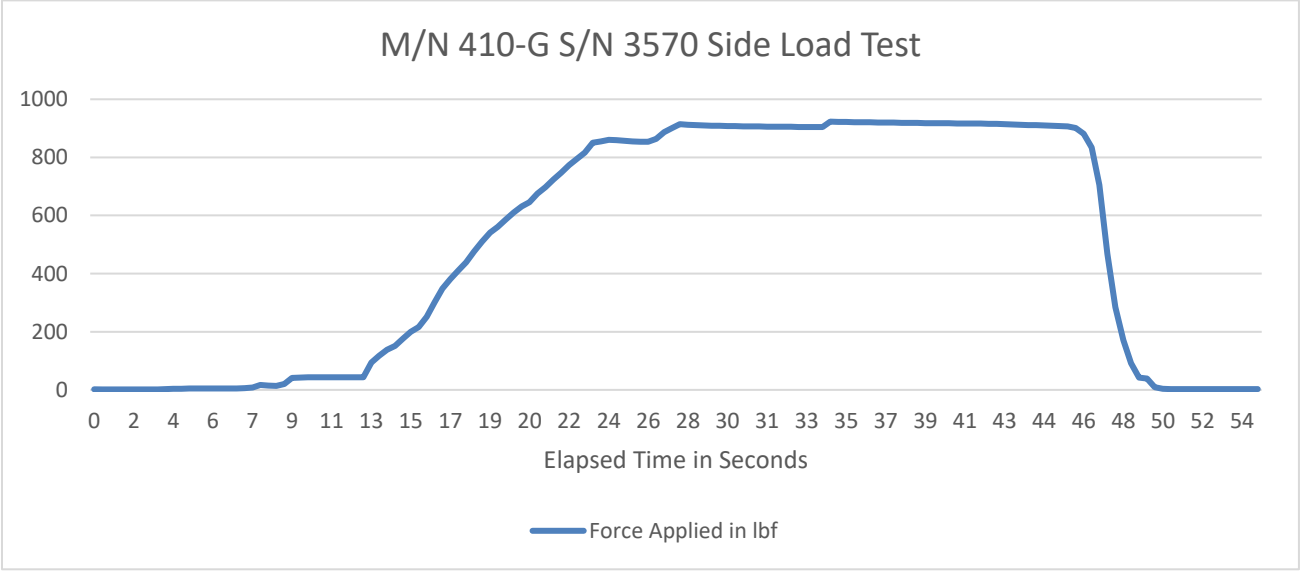
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		**X**		Operating Mode:					
Powered During Test:			**X**	V		A		AC/DC	
Physical Damage Noted:		**X**		**< 0.125" deflection**					

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www.keystonecompliance.com

ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev G	P/N:	410	S/N:	3570
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 15:45
Test Cycle Ends At:	05/24/2017 15:46
Total Number of Cycles:	1

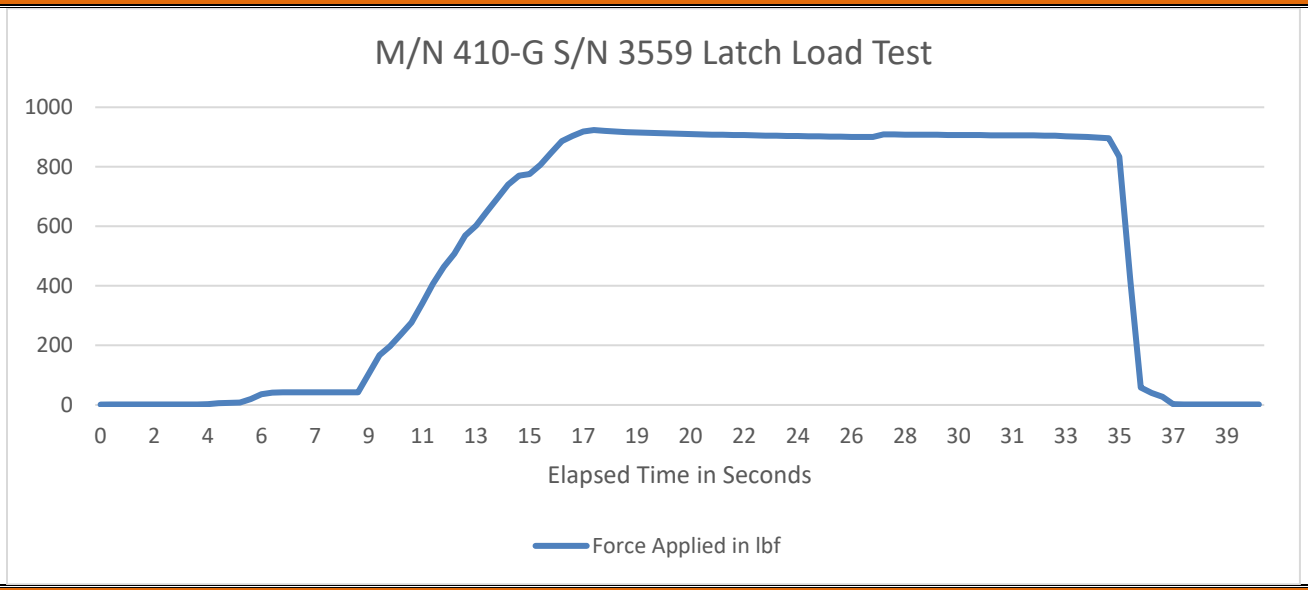
EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		X		Operating Mode:					
Powered During Test:			X	V		A		AC/DC	
Physical Damage Noted:		X		< 0.125" deflection					

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev G	P/N:	410	S/N:	3559
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 14:56
Test Cycle Ends At:	05/24/2017 14:57
Total Number of Cycles:	1

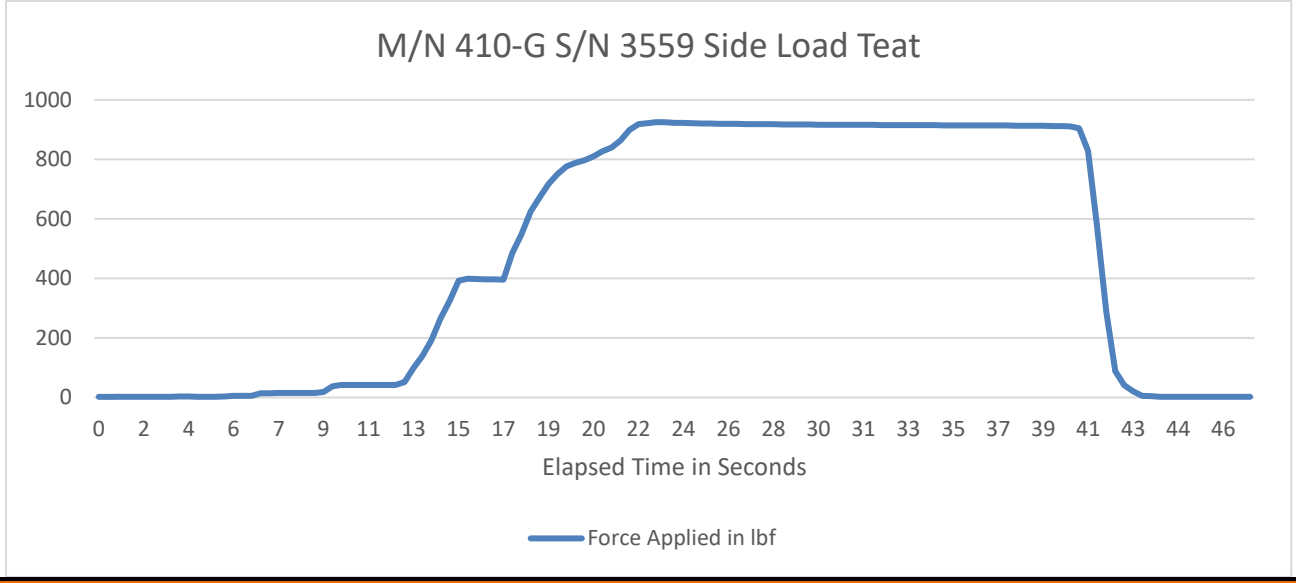
EUT Test Information	Y	N	N/A	Comments
Operating During Test:		X		Operating Mode:
Powered During Test:			X	V		A		AC/DC	
Physical Damage Noted:		X		< 0.125" deflection

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ENVIRONMENTAL TEST REPORT FOR LIFESAVING SYSTEMS

Gate Resistance Data Sheet					
EUT:	Rescue Hoist Hooks			Job Number:	1703-001NB
M/N:	Rev G	P/N:	410	S/N:	3559
Customer:	Lifesaving Systems				
Date:	5/24/17			Test Engineer:	D. Pierce
Test Specifications					
Test Spec:	ANSI Z359.1			Para./Sec.:	4.3.1.1.2

Test Profile



Environmental Profile Information	
Test Cycle Begins At:	05/24/2017 15:50
Test Cycle Ends At:	05/24/2017 15:51
Total Number of Cycles:	1

EUT Test Information	Y	N	N/A	Comments					
Operating During Test:		X		Operating Mode:					
Powered During Test:			X	V		A		AC/DC	
Physical Damage Noted:		X		< 0.125" deflection					

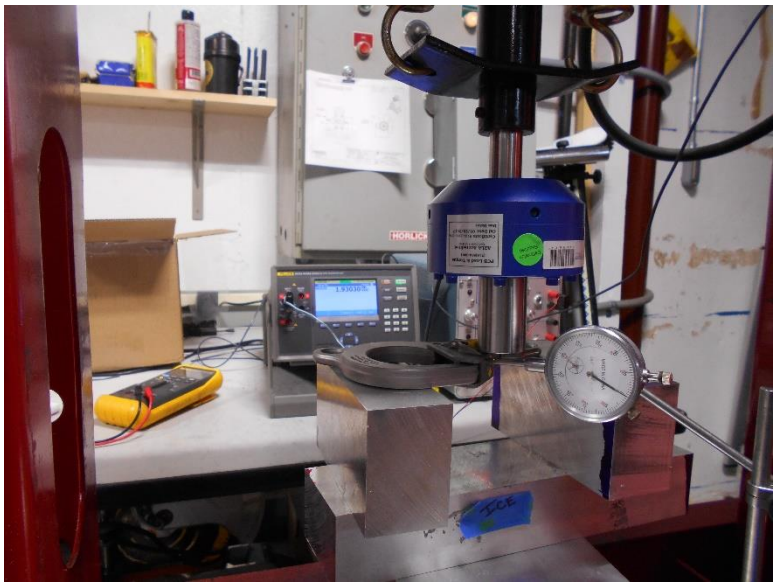
3.6.2 GATE RESISTANCE TEST PHOTOGRAPHS



Gate Resistance	
ANSI Z359.1	
Typical Latch Force Setup	
Unit Tested	Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	None
Lifesaving Systems	
Date:	5/24/17
Job #:	1703-001NB



Gate Resistance	
ANSI Z359.1	
Typical Latch Load Setup 2	
Unit Tested	Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	None
Lifesaving Systems	
Date:	5/24/17
Job #:	1703-001NB



Gate Resistance	
ANSI Z359.1	
Typical Side Load Setup	
Unit Tested	Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	None
Lifesaving Systems	
Date:	5/24/17
Job #:	1703-001NB



Gate Resistance	
ANSI Z359.1	
Force Sensor	
Unit Tested	Rescue Hoist Hooks
Model Number	Rev D & Rev G
Part Number	410 & 412
Serial Number	None
Lifesaving Systems	
Date:	5/24/17
Job #:	1703-001NB

- A 900lb load was applied on all latch and side gate testing operations per ANSI Z359.1; refer to graphs for analysis.

SECTION 4 – CONCLUSION

a) The D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, Model Number: Rev D & Rev G; Part Number: 410 & 412 ; Serial Number: 0204, 0202, 3559, 3570, 3569, 0200, 3574, 0201, 3573, 0203; was subjected to the following Environmental Tests in accordance with MIL-STD-810G :

TABLE 2 TESTS PERFORMED & RESULTS

Test Description	Results
Salt Fog	**Minor evidence of localized corrosion to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Salt Fog testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.**
Icing	**No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Icing testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.**
Transit Drop Shock	**No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Transit Drop Shock testing conditions. Functionality of Hooks verified without issue. Force required to open latch and locking mechanism met requirements. Load testing of Hooks met requirements. Final disposition is to be determined by customer.**
Gate Resistance	**No obvious signs of damage to D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks, due to Gate Resistance testing conditions. Load testing of Hooks met requirements. Final disposition is to be determined by customer.**

b) The D-LOK Rescue Hoist Hooks & Mil-LOK Rescue Hoist Hooks are being returned to Lifesaving Systems after completion of the Environmental Test.

APPENDIX: E-LABS REPORT

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ENVIRONMENTAL TEST REPORT
No. 6112

for

Blowing Sand and Dust Testing

applied to a

MIL-LOC Hook w/swivel and a D-LOK Hoist Hook

in accordance with

MIL-STD-810G w/Change 1, Environmental Engineering Considerations and Laboratory Tests
Dated: 15 April 2014

Submitted to:

Keystone Compliance, LLC
131 Columbus Inner Belt
New Castle, PA 16101

Customer PO#: 41717-01

Report Date: 17 May 2017 **Pages:** 20

Approved By:	Reviewed By:	Prepared by:
Kenneth C. Malley, Jr. CEO E-LABS, Inc. www.e-labsinc.com	Zach Miller Test Technician E-LABS, Inc.	Carl L. Moran Lab Manager E-LABS, Inc.

The data and information contained in this report are the result of independent testing and assessment conducted upon articles selected and provided to E-LABS Inc. by the customer. Neither E-LABS nor its subcontractor(s) makes any representation, expressed or implied, as to the suitability or adequacy of the opinions and results presented within pertaining to the efficiency, performance, reliability, or any other characteristic of the articles tested. This report should not be considered or used as an endorsement or recommendation of the suitability of the articles for purchase or intended use.

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REPORT No. 6112
17 May 2017

E-LABS	TITLE: ***Environmental Test Report*** Blowing Sand and Dust Tests MIL-LOC Hook w/swivel and a D-LOK Hoist Hook ***Keystone Compliance, LLC***		DATE: 17 May 2017
	DOCUMENT NO.: ***Test Report No. 6112***		REVISION -0-
ENGINEERING CHANGE RECORD		Form Approved By:	/s/ Ken Malley Jr., Process Owner

Chg.	Date	Page	Description
0	17May17	All	Original Issue

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17 May 2017

EXECUTIVE SUMMARY

E-LABS Incorporated performed Sand and Dust Tests on a MIL-LOC Hook w/swivel and a D-LOK Hoist Hook for Keystone Compliance, LLC. The MIL-LOC Hook w/swivel and a D-LOK Hoist Hook, which will be known as Equipment Under Test (EUT) throughout this report are identified in *Table ES-1*.

Testing was performed from 26 April thru 2 May 2017. The sequence of the test that was performed is listed in *Table ES-2*. All testing was performed at and under the control of E-LABS Laboratory, 5150 Lad Land Drive, Fredericksburg, VA 22407.

A summary of result of testing are presented in *Table ES-3: Test Summary* and in more detail in *Section 5.2*.

Table ES-1: Equipment Under Test

EUT Number	EUT Description	Part Number	Serial Number
1	MIL-LOK Hook with Swivel	412-G Rev D	0201
2	D-LOK Hoist Hook	410-G Rev G	3569

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Table ES-2: Tests Applied to Equipment Under Test

Test Applied	*Procedure*
Blowing Sand	MIL-STD-810G w/Change 1, Method 510.6, Procedure II
Blowing Dust	MIL-STD-810G w/Change 1, Method 510.6, Procedure I

Table ES-3: Test Summary

Test Number	Date	Test	EUT	Results
1	26Apr17	Blowing Sand	All	No anomalies observed
2	2May17	Blowing Dust	All	No anomalies observed

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1. INTRODUCTION

Keystone Compliance, LLC contracted test services for environmental testing with E-Labs. Keystone Compliance, LLC provided the EUT and specifications for performing the tests.

This report documents the preparations, set-up, methods, and results for the Sand and Dust testing.

2. TEST FACILITY

Testing was performed by E-LABS, Inc. [www.e-labsinc.com] at its laboratory facility located at 5150 Lad Land Drive in Fredericksburg, Virginia 22407.

3. EQUIPMENT UNDER TEST

The EUT was received at E-LABS on 26 April 2017 in 'No Visual Damage' condition.

4. TEST REQUIREMENTS [Applicable Documents (AD)]

Testing of the EUT was conducted in accordance with:

AD-1: E-Labs Quotation Number 06112, dated 16 March 2017

AD-2: MIL-STD-810G w/Change 1, Environmental Engineering Considerations and Laboratory Tests dated 15 April 2014

5. TESTING

5.1 Preparation

The EUT was sequenced for testing as detailed above in *Table ES-3*.

All equipment used for accuracy and data recording was calibrated with traceability to the National Institute of Standards and Technology reference standards. See *Table 5.1-1* for a list of equipment used and calibration dates.

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Table 5.1-1: Equipment and Calibration Data

Instrument	Model Number	Serial Number	Manufacturer	Calibration Date	Calibration Due Date
Data Logger	2025A	6543601	Fluke Hydra	15Jul16	15Jul17
Data Logger	2025A	5227601	Fluke Hydra	20Nov15	20Nov16
Microdust Pro Particle Counter	206001D	4139439	Casella	24Oct16	24Oct17

5.2 Description of Testing

5.2.1 Sand

Parameters:

A) Temperature: 55°C
B) Humidity: not controlled
C) Air Velocity: 29 m/s
D) Sand Composition: Silica (95% by weight SiO_2)
E) Concentration: 2.2 g/m^3
F) Duration: 90 minutes per side
G) Exposed Sides: 6 sides

Procedure:

Step 1) The sand chamber was setup for a wind velocity of 29 m/s and the sand feed auger set for a concentration of 2.2 g/m^3.

Step 2) The EUT were installed into the chamber with the first of the six sides exposed to the air flow.

Step 3) The air temperature was set to 55°C and allowed to stabilize.

Step 4) After thermal stabilization, the sand feed was initiated. The EUT was subjected to 90 minutes of blowing sand at 55°C and 29 m/s air speed.

Step 5) After 90 minutes the EUT were rotated to expose the second side to the blowing sand.

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Step 6) Steps 3 thru 5 were repeated until all 6 sides of the EUT had been exposed to the blowing sand for 90 minutes.

Results:

There were no anomalies observed with any of the EUT after exposure to the blowing sand at 55°C. Customer performed an operational test and retained all data.

See Photos 5.2.2-1 thru 5.2.2-7 for Blowing Sand Test Setup

See Chart 5.2.2-8 for Blowing Sand Test Temperature Profile

Photo 5.2.1-1: Blowing Sand Setup, Side 1



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Photo 5.2.1-2: Blowing Sand Setup, Side 2



Photo 5.2.1-3: Blowing Sand Setup, Side 3



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Photo 5.2.1-4: Blowing Sand Setup, Side 4



Photo 5.2.1-5: Blowing Sand Setup, Side 5



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Photo 5.2.1-6: Blowing Sand Setup, Side 6



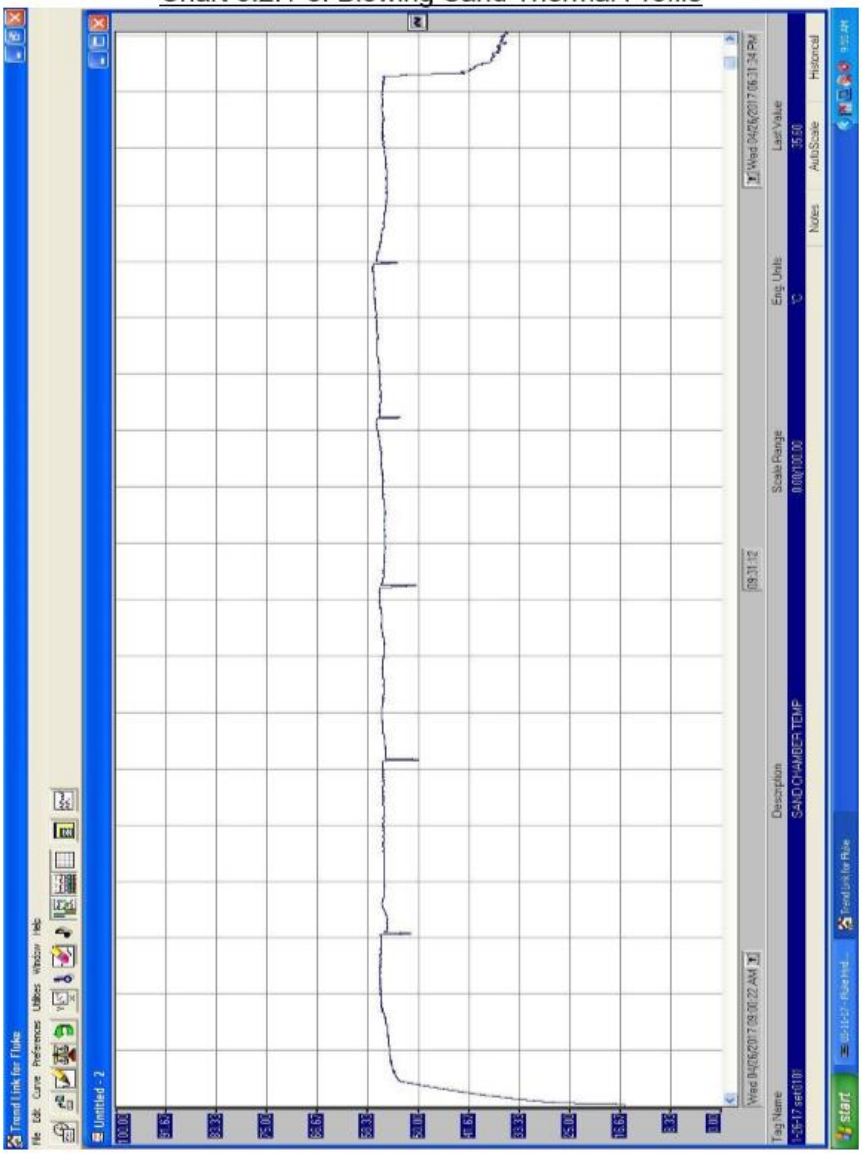
Photo 5.2.1-7: Post Blowing Sand Test



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Chart 5.2.1-8: Blowing Sand Thermal Profile



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5.2.2 Blowing Dust

Parameters:

A) EUT: All
B) Concentration: 10 ± 7 g/m^3
C) Velocity: 8.9 m/s
D) Temperature: 25°C and 55°C
E) Humidity: < 30 % RH
F) Exposed Sides: 6 sides
G) Duration: 60 minutes per side each temperature

Procedure:

Step 1) The dust air speed was adjusted to 8.9 m/s and the dust concentration was adjusted to 10 ± 7 g/m^3 using the particle counter to verify.

Step 2) The EUT were positioned in the dust chamber and the chamber temperature was set to 25°C.

Step 3) The EUT were subjected to the blowing dust at 25°C for a period of one hour.

Step 4) After one hour, the dust feed was paused and the EUT was reposition to expose the next side to the blowing dust.

Step 5) Steps 3 and 4 were repeated until all six sides had been exposed to the blowing dust at 25°C for one hour.

Step 6) After completing all six sides at 25°C, the chamber temperature was increased to 55°C and allowed to stabilize.

Step 7) The EUT were subjected to one hour of blowing dust at 55°C on each of six sides.

Step 8) After a total of six hours at 55°C, the dust feed was aborted and the EUT were visually examined for damage.

Step 9) End of the Blowing Dust test.

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Results:

There were no anomalies observed with the EUT after the dust exposure for six hours at either temperature.

See Photos 5.2.1-1 thru 5.2.1-8 for Blowing Dust Test Setup

See Chart 5.2.1-9 for Blowing Dust Test Temperature Profile

Photo 5.2.2-1: Blowing Dust Test Setup, EUT Side 1



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Photo 5.2.2-2: Blowing Dust Test Setup, EUT Side 2



Photo 5.2.2-3: Blowing Dust Test Setup, EUT Side 3



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Photo 5.2.2-4: Blowing Dust Test Setup, EUT Side 4



Photo 5.2.2-5: Blowing Dust Test Setup, EUT Side 5



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Photo 5.2.2-6: Blowing Dust Test Setup, EUT Side 6



Photo 5.2.2-7: Post Blowing Dust Test, EUT 2



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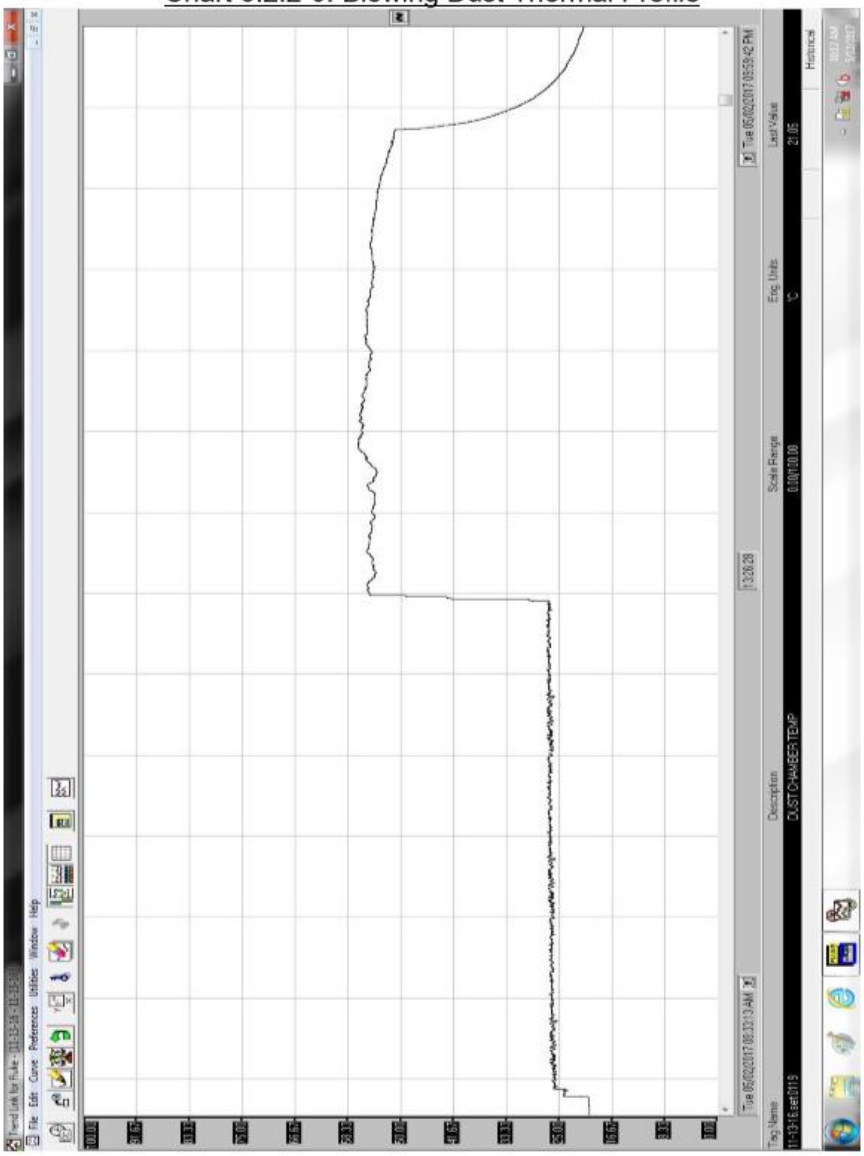
Photo 5.2.2-8: Post Blowing Dust Test, EUT 1



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Chart 5.2.2-9: Blowing Dust Thermal Profile



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6. ACCEPTANCE CRITERIA

Acceptability will be contingent upon the ability of the EUT to perform its function before, during and after the test.

7. TEST RESULTS

See table ES-3 and section 5.2 for test results.

8. TEST MODIFICATIONS

None

9. TEST ITEM DISPOSITION

The EUT was returned to Keystone Compliance, LLC

10. PERSONNEL

Zachary Miller

11. REPORT DISTRIBUTION

A. Keystone Compliance, LLC
131 North Columbus Inner Belt
New Castle, PA 16101
Attention: Scott Miller Email: Scott@keystonecompliance.com

B. E-LABS Job Number 6112

END OF REPORT